**BMR 3216 ONCOLOGY AND RADIOBIOLOGY**

Course description:

The course aims to present basic concepts and principles of radiation biology in radiation therapy. The content will address the theories and principles of tolerance dose, time-dose relationships, fractionation schemes and the relationship to the clinical practice of radiation therapy as well as radiation interaction of body and resultant biophysical events. The course also addresses the practical management of cancer patients, roles of radiotherapy, chemotherapy and hormonal therapy, Radiation Therapy techniques, including external beam radiation and Brach therapy is emphasized

Purpose:

To enable the student acquire knowledge in radiobiology and skills of radiation protection in radiotherapy procedures.

Course objectives By the end of the course, the student should be able to:

1. Describe the epidemiology of cancer

2. Define the principles of immunology and histopathology in diagnosis and treatment of cancer

3. Define principles of medical and surgical oncology

4. Discuss the systemic review of radiosensitive cancers.

5. Discuss radiosenstivity and embryogenic effects of radiation

6. Describe principles of cellular biology and apply to principles of radiation biology.

7. Apply laws and principles of radiation biology to the clinical practice of radiation therapy.

8. Distinguish between units of radiation quantities and radiobiologic measures and demonstrate correct usage.

9. Identify factors influencing radiobiologic/biophysical events at the cellular and sub-cellular level.

10. Describe radiation induced chemical reactions and analyze biologic damage.

11. Apply the principles of radiobiology to tumor cell biology and evaluate radiation effects anticipated in the clinical practice of radiation therapy.

12. Describe the relationship of time, dose, fractionation, volume and site to radiation effects.

13. Describe the use of radiation response modifiers in the clinical practice of radiation therapy.

14. Describe the principles of chemotherapy and the influence on biologic effects in combination with radiation therapy.

Expected outcomes/Competencies:

Ability to apply the principles of radiobiology when handling patients during radiotherapy procedures.

Course content:

• Epidemiology of cancer. Principles of immunology and histopathology in diagnosis and treatment of cancer.

Principles of medical and surgical oncology.

• The psychology of cancer and cancer nursing, principles of radiation oncology; cancer and fertility.

Systemic review of cancer. Head and neck cancer, CNS cancers, lung cancer, GIT cancers, lymphomas, testicular cancer, bone and soft tissue, sarcoma, leukaemias, gynaecological cancers, skin, cancer. Cell tissue and tumour kinetics; Time dose and fractionation in radiotherapy; Radiosensitive; chemoradiotheraphy; oncogenic transformation and onogenes; Embryogenic effects of radiation; sensitivity of tissues; acute effects of whole body radiation.

Delivery methods:

Over-view lectures, Small group tutorials with a Tutor, Self-directed study, Wrap-up seminars, Question and answer sessions, Skills training, Assignments, practicals and Videos for watching.

Assessment strategies:

There shall be an assessment blue-print for assessment.

Formative and summative assessment shall be conducted through MCQs. Essays, short answer questions, Objective Structure Clinical Examination (OSCE), Objective Structure Practical Examination (OSPE) and logbook/ Portfolio

Course duration: 5 Weeks

Requirements: CH, 5CU

Resources & Infrastructure available:

Libraries, Book banks, Tutorial rooms, Computer services and internet, Content experts and audiovisual materials/ resources. Radiotherapy (Laboratory) rooms

And IT Labs